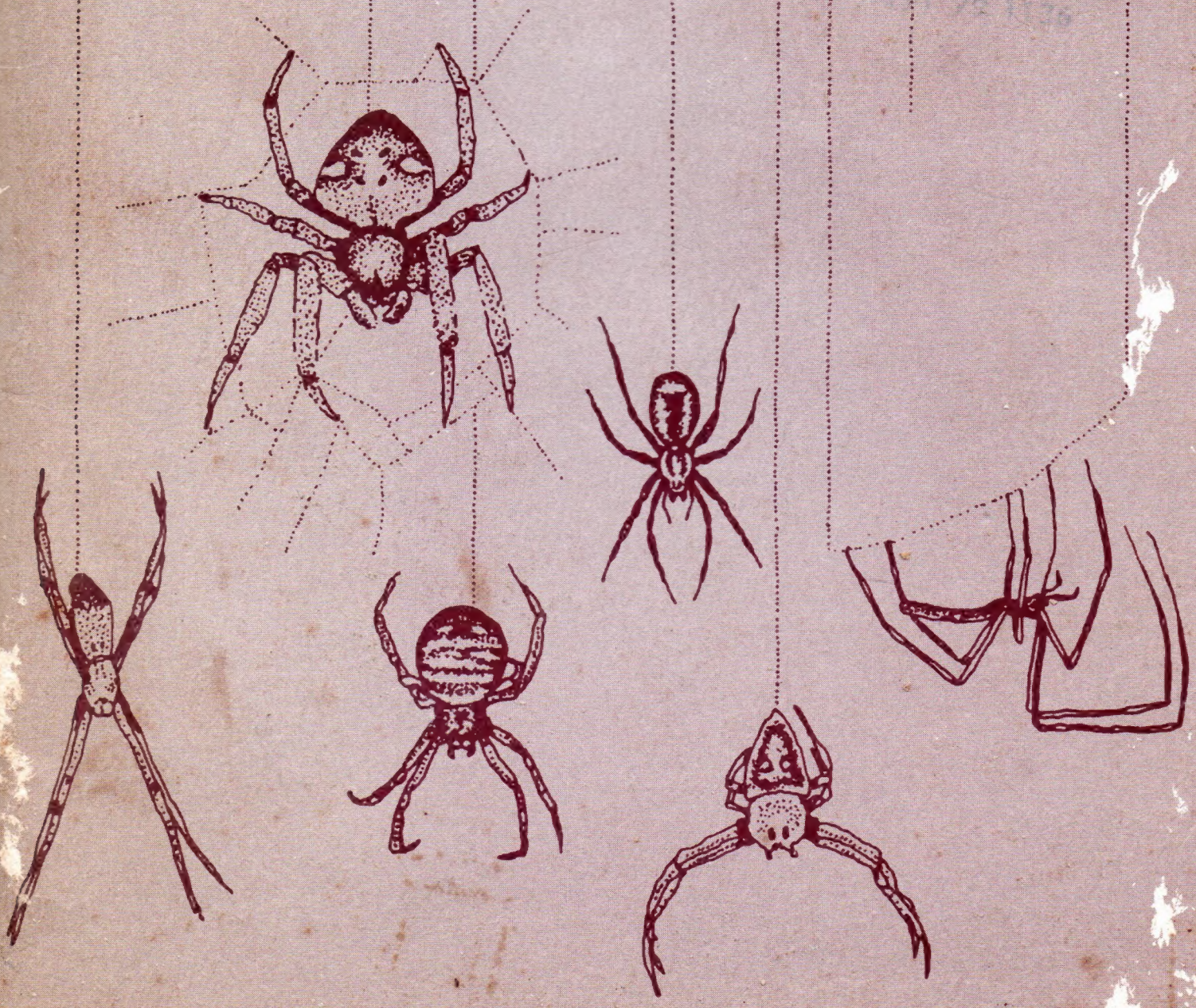
JUNIOR SURVIVAL

SPIDERS

Produced and Published by the Gould League of Victoria



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* Suitable for children.

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What is a Spider?

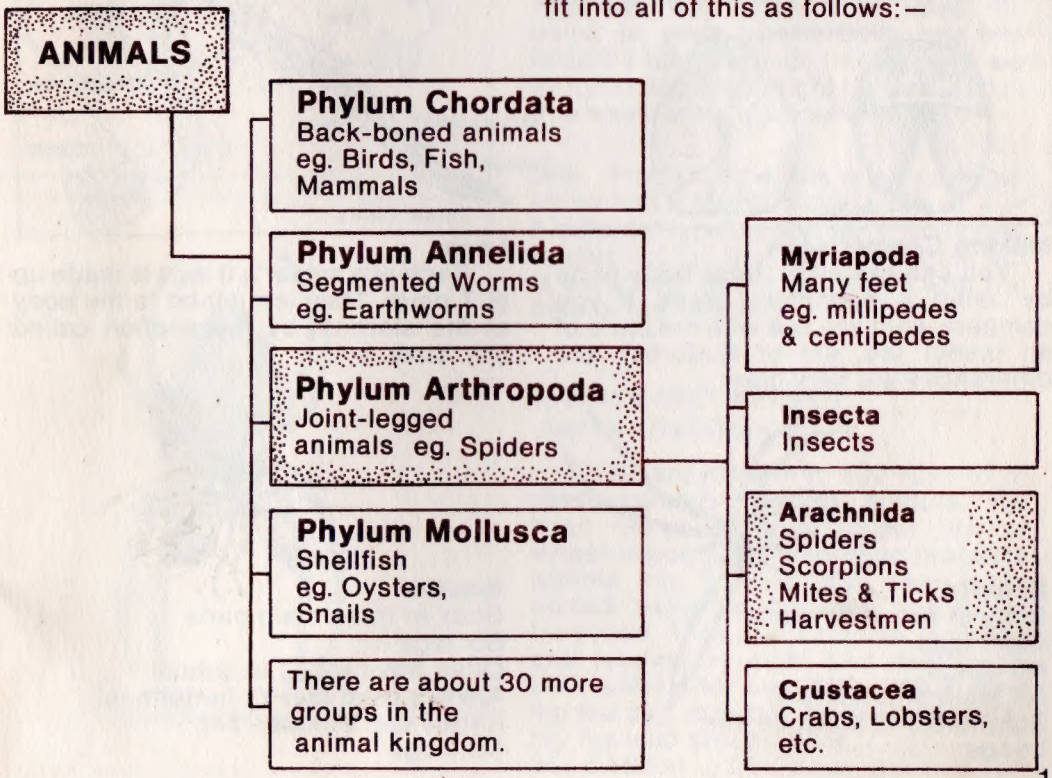
Most of us can recognise a spider when we see it. We usually know it from its web or the fact that it has eight legs. Perhaps we remember how spiders are different to insects because so many of us are afraid of them. Spiders, more than any other animal, tend to give humans "the creeps". Yet, if you look closely, the world of spiders is full of strange beauty, brilliant colors and ingenious inventions.

True, some are poisonous. One or two can be fatal, but the rest of Australia's spiders are not dangerous. Although many have painful bites, no spider will attack a human. Rather, it will seek hiding and shelter and only bites us when handled or contacted in some way. Apart from this, spiders are not a threat to humans but are actually very important insect controllers — something which makes them more our ally than our enemy.

But back to the question, what is a spider? One way to find an answer is to see how scientists have organised living things into groups and to look at where spiders fit into the system.

First of all, there are two divisions — plants and animals. Then we can divide all animals into two main groups, those with backbones and those without. We fit into the first group, along with reptiles, birds, fish and mammals. This group is known as the vertebrates or chordates. The second group, called invertebrates (animals without backbones), includes insects, spiders, crabs, worms, shellfish and snails.

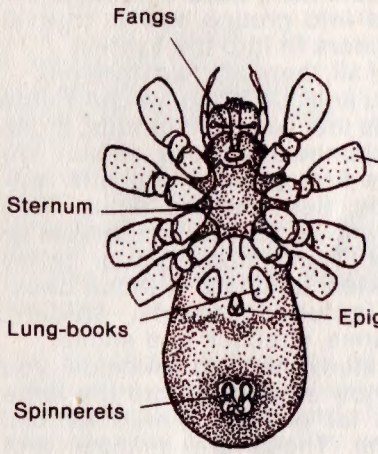
If you study the diagram below, you can see how spiders fit into the large subgroup (or phylum) which we call Arthropods. These are animals with jointed legs and with the skeleton on the outside of their bodies (exoskeleton). Inside this exoskeleton are their soft, boneless bodies. Spiders fit into all of this as follows:—



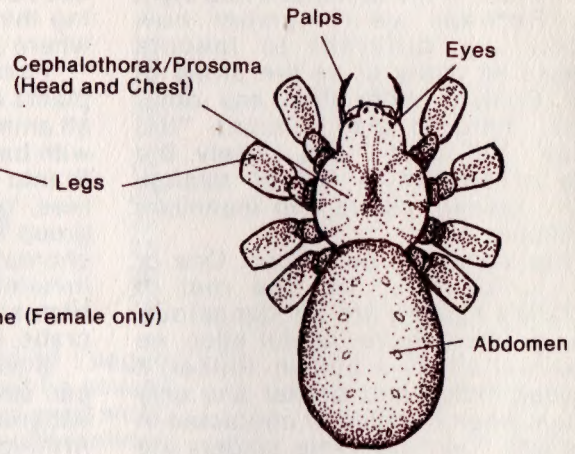
Body Parts

EXTERNAL

Under View (Ventral)

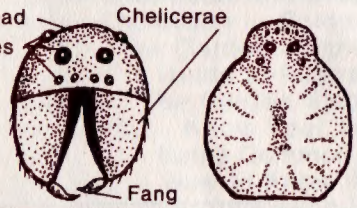


Top View (Dorsal)



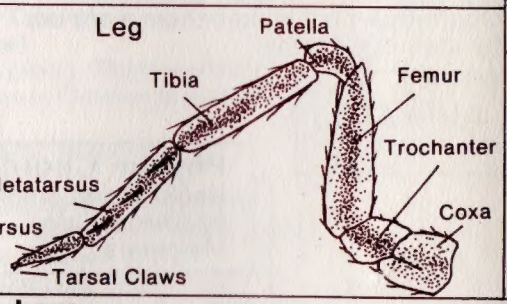
Face Front View

The Wolf Spider has 8 eyes arranged in 3 rows.



Head Top View

Leg

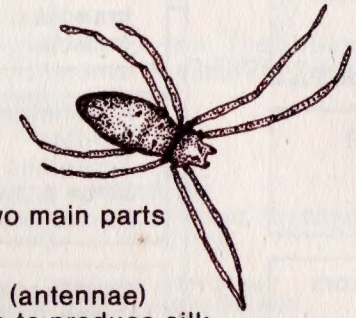


Making Comparisons

You can see all of these body parts by using a magnifying glass. If you compare what you see with the parts of an insect (eg. ant or butterfly), the differences are very clear.

Legs

Each of a spider's 8 legs is made up of 7 parts. They are joined to the body at the sternum by the section called the coxa.

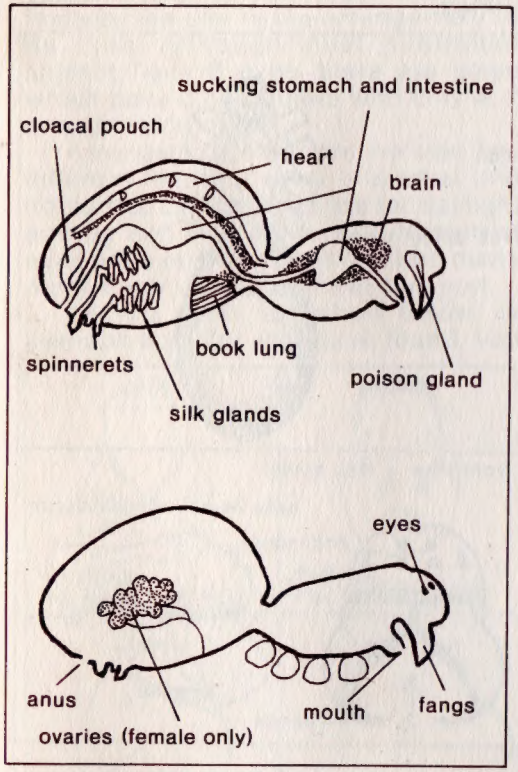


Spiders
Body in two main parts
Eight legs
No wings
No feelers (antennae)
Spinnerets to produce silk
Lungs

Insects
Body in three main parts
Six legs
Often have wings as adults
Always have feelers (antennae)
Rarely can produce silk
No lungs

INTERNAL

Inside a Spider




GARDEN ORB WEAVER

Feeding Using the strong chelicera, spiders sting their prey, kill or paralyse it with the poison from their fangs and then drain the juices from its body with its sucking stomach.

Circulation Unlike insects, spiders have a simple blood circulation system. The clear liquid is pumped around their bodies carrying oxygen from the book lungs. A long, muscular tube in the abdomen acts as the heart.

Breathing Like humans, spiders use up oxygen and discharge carbon dioxide. The waste gas passes through the thin leaves of the book lungs. At the same time, the blood gains a new supply of oxygen from the air. Most spiders have only one pair of book lungs but more primitive spiders (eg. Trapdoor, Funnel Web) have two pairs.

Reproduction The male uses his palps to pass sperm cells into the female's body through her epigyne. Up to 1,000 egg cells might be fertilised in this way during a single mating.

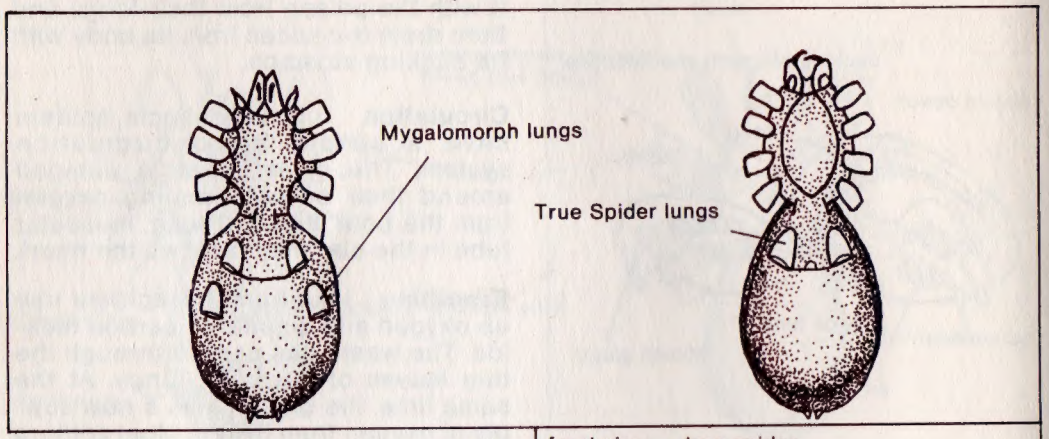
Silk Production of silk is very complicated and a spider might produce 4 or 5 different types, depending on its use. It does not fall from the spinnerets but is drawn out of the tiny holes with the help of the rear leg.

GARDEN ORB WEAVER
Araneus transmarinus

There are more than 100 species of these common Garden spiders. We have all seen their familiar orb or wheel-shaped web and have probably walked into it since they often build across paths or between shrubs at face level. They are nocturnal, building and feeding at night and destroying their webs after use. After hiding during the day, they can be seen re-building the web around dusk.
BL: ♂ 15mm ♀ 20-25mm ♀ x 1.

Lungs

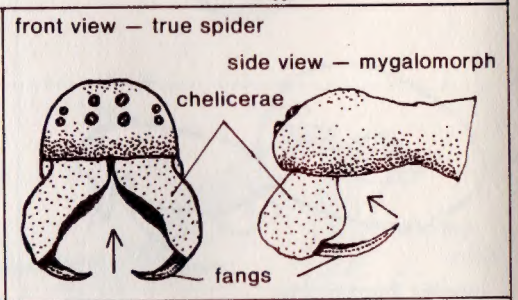
On the underside of the spider's abdomen you will see either 2 or 4 pale patches. Beneath these marks are the lungs.



Fangs

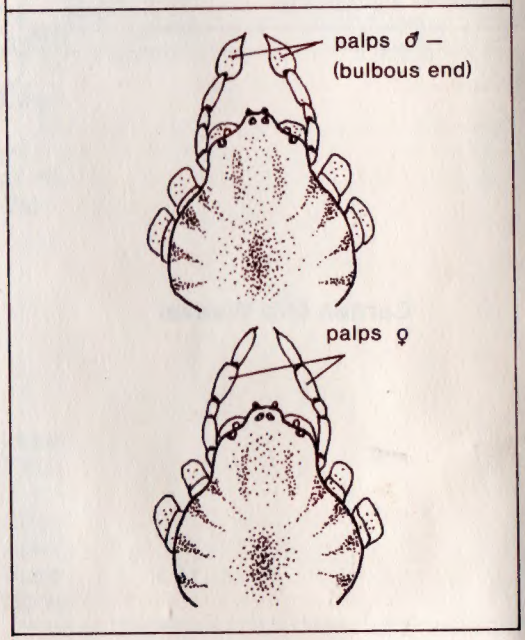
Near the head are the chelicerae. These are the the two powerful weapons used to seize and kill prey. Each is made up of two parts. A large, strong part which is joined to the head is the base segment. At the end of this is the fang. Poison glands inside the head prepare the venom which flows down fine tubes and out near the tips of the fangs. Together they make a very effective killing system.

There are two types of fangs. True spiders (2 book-lungs) have fangs which open and close together, like pincers. More primitive spiders have their fangs side by side and strike downwards into their prey. To do this, these Mygalamorph spiders (4 book-lungs) have to rear up, almost like a horse on its hind legs. Most dangerous spiders belong to this group.



Palps

These are the leg-like parts on either side of the spider's mouth. Although they are never used for walking, you can see spiders holding their palps out in front of them as they walk, touching the ground from time to time as they go. It could be that there are organs in them for picking up scent or sound. One way to tell a male spider from a female is to look for the bulbous ends of its palps.



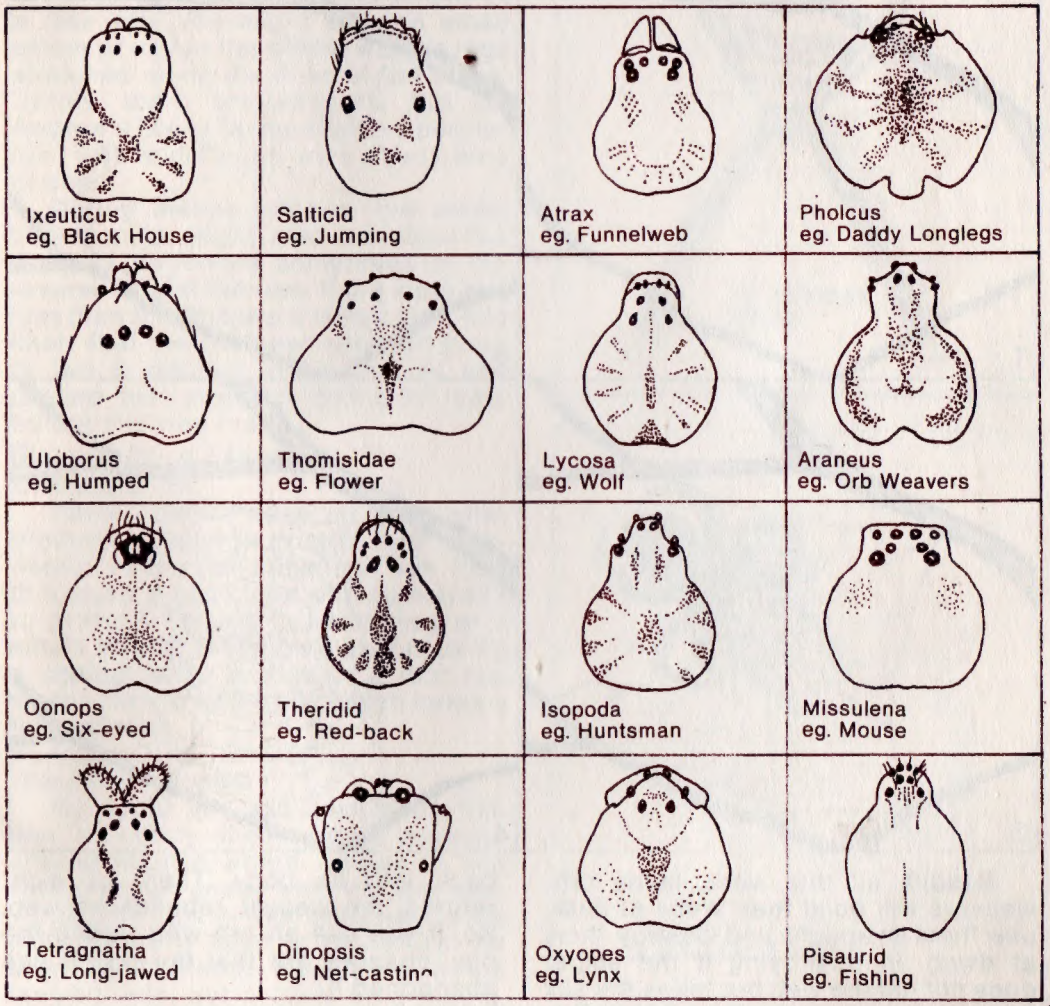
Eye Patterns

When it comes to identifying spiders, one of the most important features we use is the arrangement of its eyes. Although most Australian spiders have 8 eyes, there are some which have 6 and others with only 4, 2 or even none at all.

Amongst spiders there are also two different kinds of eyes — diurnal and nocturnal. Diurnal eyes are for daylight activity and look quite dark. Nocturnal eyes are a pearly white color and many night-hunting spiders have this sort.

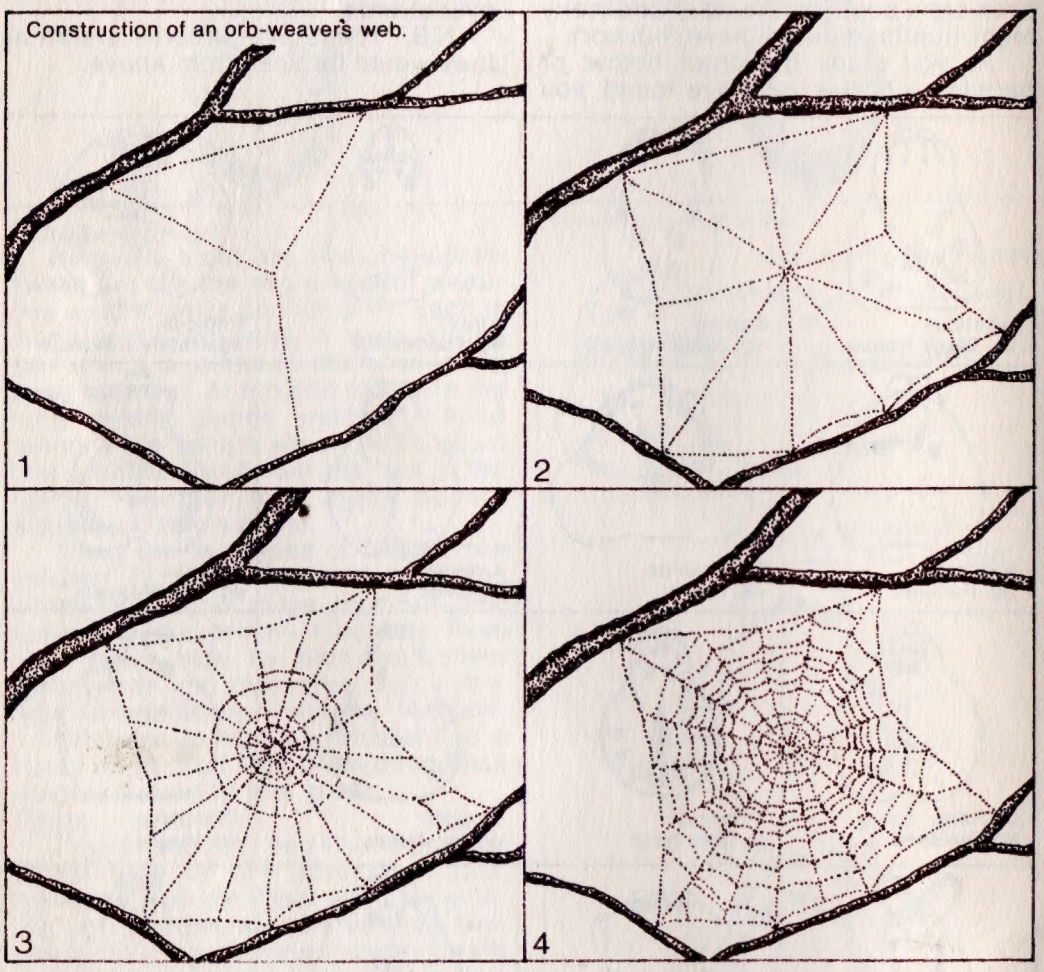
As you study the chart below, or perhaps a spider you have found, you could try to see what sort of eyes it has. The size, color and arrangement of eyes can vary, depending on whether or not the spider relies mostly on its eyes for feeding. Web weavers, for instance, rely more on the vibrations caused by trapped prey but hunting spiders usually have large eyes with good vision. Even if your own vision is excellent, you will still need a magnifying glass or microscope to read the eyepatterns.

N.B. These eye patterns are all as they would be seen from above.



Silk is one of the strongest, most flexible and elastic materials produced in the natural world. With these qualities, the adult spider is able to use it for a wide range of purposes, including protection, shelter, feeding, transport, communication and navigation.

Although silk has all these uses, we tend to think of it mostly as a web-building material. For many spiders, webs are not important. They are hunters and depend on silk for other reasons as we shall see later (Page 9). However, when it comes to webs, many of us think mostly of the orb or wheel web. With its regular structure of spirals and radiating lines, it is the spider's most artistic work. Using dry silk for the framework the orb-weavers then build a sticky spiral. When finished, the web makes a beautiful trap. The stages of building such a web are:—



Despite all this work, many orb-weavers will build their webs at dusk, use them overnight and destroy them at dawn. In destroying it the spider does not eat the web but takes the silk back into its body. Then, as night returns, the weaver rebuilds its web. So, if you see an orb-web during the day, chances are that the spider has abandoned it.

Stabilamentum

Many orb-weavers build a special structure in the centre of their webs. Known as the stabilamentum, it is a broad strand of silk which usually forms a straight ribbon or cross at the hub. At other times it is no more than a patch in the middle. What it is used for is not certain. It may be to strengthen the web or perhaps it helps to camouflage the spider in the centre.

ST. ANDREW'S CROSS SPIDER
Argiope principalis

You can see the x-shaped bands of silk, or stabilamentum which give this spider its name. If you looked closely at a real web, you might see the small spider at rest in the centre with its legs stretched along the lines of the cross. Unlike some orb-weavers, the St. Andrew's Cross Spider builds a permanent web and can be seen at any time of day.

During mating season, the small, brown male might also be observed close to the female, sometimes on the reverse side of the web. If the male has less than 8 legs, have a closer look. It is likely that the male has dropped a leg or two to distract the female as she chased him away for trying to mate before she was ready.

BL: ♂5mm ♀14mm ♀ x 1½.

Cribellate

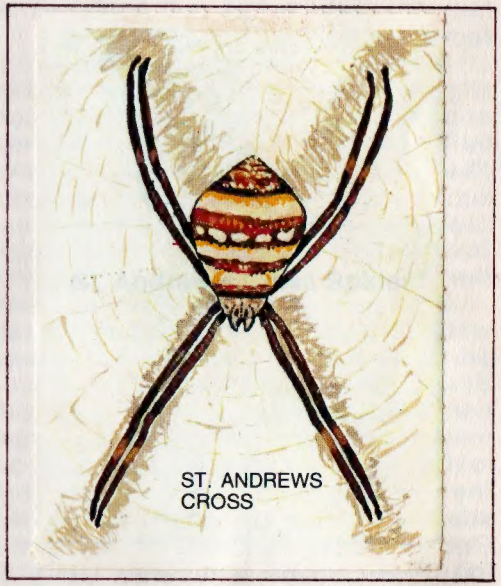
Some spiders have an extra silk-producing organ in front of their spinnerets, called the cribellum. Silk from this organ is combined with normal silk to produce tangled band instead of a single thread. A combing action, using a special hairy section of a rear leg, slowly draws out the silk which forms a tangled web.

BLACK HOUSE SPIDER
Ixeuticus robustus

No doubt you will have seen this one. Its untidy sheet web is common around houses where it likes to use wall cracks, fences and window crevices. The tunnel-like entrance to its web makes it easy to recognise. As soon as it senses movement in the tangled web, out it darts from hiding. Speed is important here because the silk is not sticky and the spider depends on insects tripping and becoming entangled.

DANGEROUS: A bite from this spider is very painful and serious.

BL: ♂12mm ♀18mm ♀ x 1.



Sheet, Tangle and Snare

You could say these are the untidy spiders, at least when you compare their web work with the graceful orbs of others. Nearly all suburban houses will have had at least one uneven tangle of a web in a corner somewhere. Daddy Long-legs is one of the most common builders of this sort of web which it normally sets up in the corner of a room.

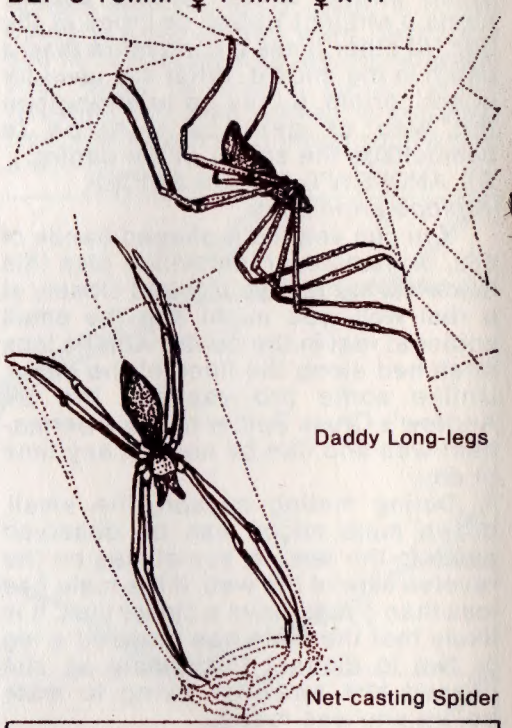
Similar to the tangle web is a slightly more organised type, the sheet and tangle. The Red-Back Spider builds this sort which is often made up of a tangled sheet-like stretch of silk, supported above and below by threads to any nearby structure. Sometimes the sheet is bowl-shaped or pulled up in the centre to look like a small tent.

Perhaps one of the most unusual webs, though, is one which is almost portable. The family of Net-casting Spiders uses silk to produce a thin, lattice web of single strands. Usually built only several centimetres above a large leaf or small branch and often close to the ground, these threads are the scaffolding for the spider's main work. Once this is completed, the Net-casting Spider builds a net web. Using a combing action, like the Black House Spider, it makes a small rectangle of cribellate silk with a few loops. Then, hanging upside down, with the net in its front legs, the spider waits. As soon as a small insect appears on the twig or leaf below, down springs the spider and its prey is quickly trapped within the net.

RED-BACK SPIDER
Latrodectus mactans hasseti

No bigger than a pea, the Red-Back has a big reputation as a dangerous spider. Its bite is known to cause death and the animal should be treated with great care. A small stripe on the abdomen makes it fairly easy to recognise in its favorite haunts under stones, in sheds or outhouses and beneath logs or vegetation litter. Its web is untidy and usually built so that it touches the ground. Related to the American Black Widow Spider, it feeds on a variety of small animals.

BL: ♂10mm ♀14mm ♀ x 1.



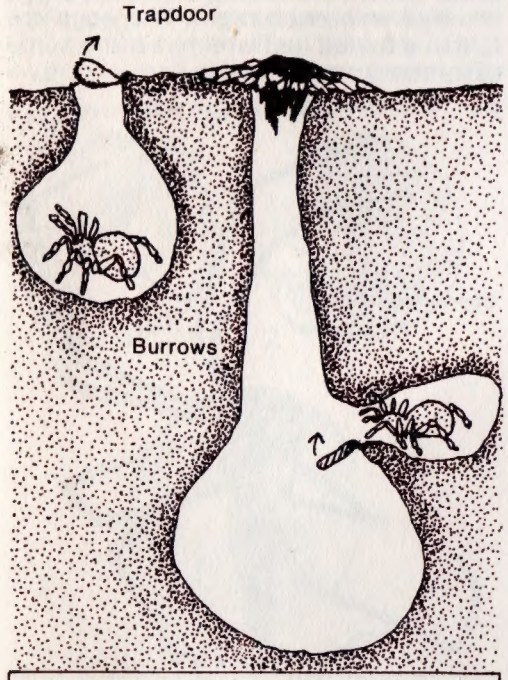
Daddy Long-legs

Net-casting Spider

REDBACK SPIDER

Burrows, Trapdoors, Hunters & Ambushers

Not all spiders spin webs with their silk. For many, successful feeding depends on good eyesight and the ability to run faster or jump further than their prey.



JUMPING SPIDER

Some we can call the ambushers, lie in hiding and leap out on passing insects. Others don't hide but have developed bodies which resemble flowers and simply wait in areas used by insects. One hunter has gone even further than this and actually 'shoots' its prey. Called the Spitting Spider, it moves very slowly, creeping up on its victim and when it is close enough it spurts out a stream of sticky, poisonous liquid from its fangs. The insect has no chance and finds itself instantly glued to the spot.

Trapdoor Spiders are another family which don't build webs. Instead they dig burrows into the earth and seal them with silk. Sometimes the burrow is no more than a single shallow shaft. For other spiders, there might be vertical shafts with one or more horizontal tunnels, perhaps even two doors. During the day, the spider usually retreats well into the burrow but spends the night crouched just beneath its entrance. There it waits for the vibration of one of its silken trip-threads, indicating there's an insect just outside. Then, up flies the lid and the spider rushes out to capture its prey.

They are generally large spiders which are part of the primitive mygalomorph group. All have venom which is harmful to humans and none should ever be handled.

JUMPING SPIDER
Saitis volans

Apart from its brilliant colors, this spider has another very "un-spiderish" feature: it has a flap on either side of its abdomen. Although these might be used in courtship display, they are most likely to be spread out as it jumps, helping it to glide further. For this reason it is sometimes known as the Flying Spider and can leap up to 170mm. Naturally, to hunt like this, it depends on its very good eyesight.

BL: ♂5mm ♀4mm ♂x 4.

COURTSHIP AND MATING

Sperm Induction

Like snakes, spiders shed their skin. Both males and females do this several times as they mature. This is known as moulting (see Page 14) and you have probably seen the empty skins often lying around like hollow spiders. After their final moulting, spiders are ready to mate. For some males, this could mean that much of their bodies deteriorate. They become thin and only the sexual organs — the palps — remain large. When preparing to mate, the male draws the sperm from its abdomen and into its palp. These are very complicated organs which work in a way similar to a syringe.

Courtship

When ready to begin courtship, the male spider goes out in search of a mate. Sometimes the male will walk overland to find her. Other times he might use a silk bridge. Whatever method he uses, the male never fails to find her and it is still a mystery to us how he does it.

To attract the female, and to make sure he is not attacked by her, the male often uses a courtship signal. This might be a rhythmic stroking of the female's web, attracting her to a special mating strand; or the male might perform a long dance, particularly if he is brightly colored like the Jumping Spider.

Mating

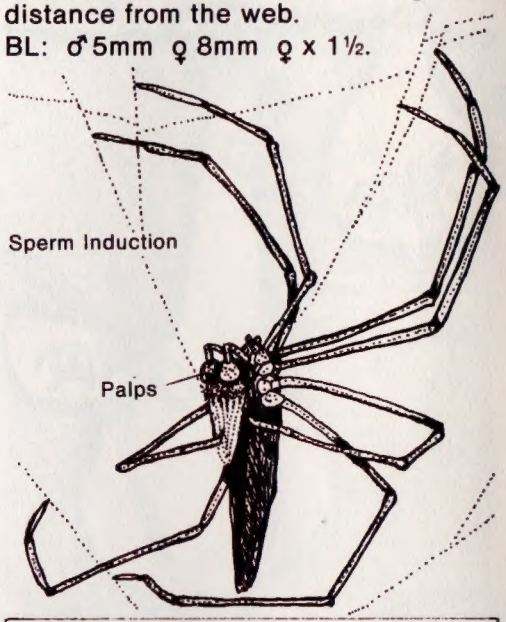
Mating can be hazardous for male spiders. If the female is not ready or not sure what he wants, the eager male ends up as dinner, instead of as a mate. However, if successful, he uses his palp to place the sperm inside the female's epigynum. Here it is stored until the eggs are laid.

After this, males of some species are eaten by the female. For many species, the males will die shortly after mating.

LEAF-CURLING SPIDER
Phonognatha graeffei

A cleverly used leaf at the centre of its web gives this spider a disguised shelter. The leaf is dragged up on a silk line, often as much as 1½ metres above the ground. A series of tight threads are wrapped around it to form a long, tube-like retreat. During the day the spider rests here, re-building the rest of its orb-like web each night. The eggs are laid in a folded leaf which is hung some distance from the web.

BL: ♂5mm ♀ 8mm ♀ x 1½.

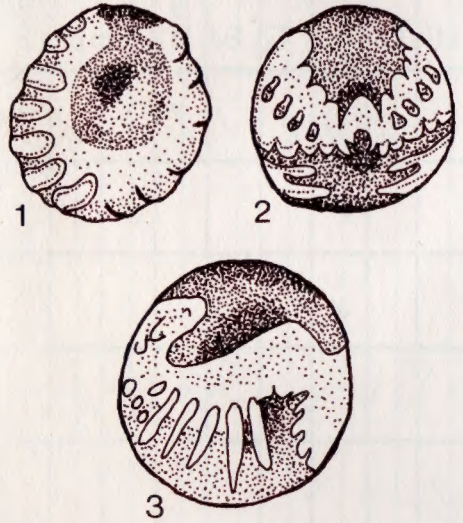


EGGS AND DISPERSAL

Eggs

After mating, the female will retire to part of the web to wait until she is ready to lay her eggs, Depending on her size, she will lay around about 100 eggs, although some spiders lay up to 1,000 eggs in a season. Again, depending on the type of spider, the eggs might be orange, yellow or green. For most spiders they will be white or pale yellow.

Egg development of a true spider



As it is laid, each egg passes through the sperm and is fertilised. When she has finished laying, the female spider will often build a special sac to protect the eggs. Made of silk, this sac varies from being very soft and fragile to strong, tough material that protects the eggs from predators. Others leave them uncovered. Then the spider will either stay with the eggs until they hatch or leave them to look after themselves.

Hatching and Dispersal

Insects' eggs have no yolk and produce larvae (grubs) which develop into mature insects. Spiders' eggs have a yolk and so allow the young to be developed into small spiderlings when they hatch.

When they emerge, it might look as if many are already dead. What has really happened is that the spiderlings have their first moult before hatching. Once out there are many ways used by different spiderlings to enter the world. Some will remain with the mother for a while and crawl off to burrow nearby. Many spiderlings let out a silk thread and the wind carries them aloft like a balloon.

WOLF SPIDER
Lycosa godeffroyi

These are ground hunters. Although they are basically a drab grey-brown color, to suit their environment, a close look will often reveal beautiful patterns of black, browns and greys across its back. The Wolf Spider lives in a shallow burrow without a lid but sometimes builds a rim around the entrance to protect it from flooding.

In courtship the male performs an elaborate dance, weaving about and waving his palps and front legs in a definite rhythm. After mating, the female will carry her egg-sac behind her, attached to her spinnerets. Once hatched, the spiderlings will ride around on the mother's back for a while.

BL: ♂12mm ♀ 14mm ♂x 1½.

Looking for Spiders – A Habitat Chart

Where do you find Spiders?

Spiders are mainly nocturnal (active at night) creatures and you will have to search carefully to find them during the day. This chart shows you where to look for certain spiders. Those spiders not illustrated here are shown in another part of the book.

Collectors should use containers and not handle the spiders. (See Page 24.) An asterisk (*) means the spider is dangerous.

Spiders	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Habitats	H	O	T	T	S	B H	H	H	B H	B H	B H	H	H	A	A	A	O	O	O	B
Inside/Around Buildings	✓	✓	✓	✓	✓	✓														
On or Close to the Ground			✓				✓	✓	✓	✓	✓									
Under Stones, Leaf Litter, Logs, etc.			✓													✓				
Low to Medium Foliage					✓		✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	
Tall Shrubs to Trees	✓										✓						✓	✓	✓	
On or Under Bark	✓				✓		✓					✓								
Rocks, Walls, Sandstone, Caves and Banks			✓	✓		✓		✓									✓			
Close to Water.									✓								✓			✓

Spiders

1. Huntsman
2. Humped
3. Red-Back *
4. Daddy Long-legs or House Dweller
5. Black House *
6. Dysdera * (Six-eyed Hunter)
7. Nursery Web
8. Jumping
9. Wolf
10. Trapdoor
11. Funnel Web *
12. White-tailed
13. Lynx
14. Net-casting
15. Crab/Flower
16. Bolas
17. Orb Weaver
18. Garden
19. Leaf Curling
20. Marine

Catching Food

KEY

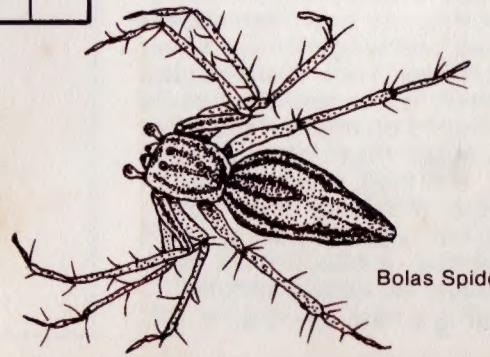
No Webs — Hunters — H
Ambushers — A
Fishers — F
Burrow — B

Spiders with Webs — Orb — O
Tangle — T
Sheet — S

Humped Spider

Nursery Web Spider

Six-eyed Hunter



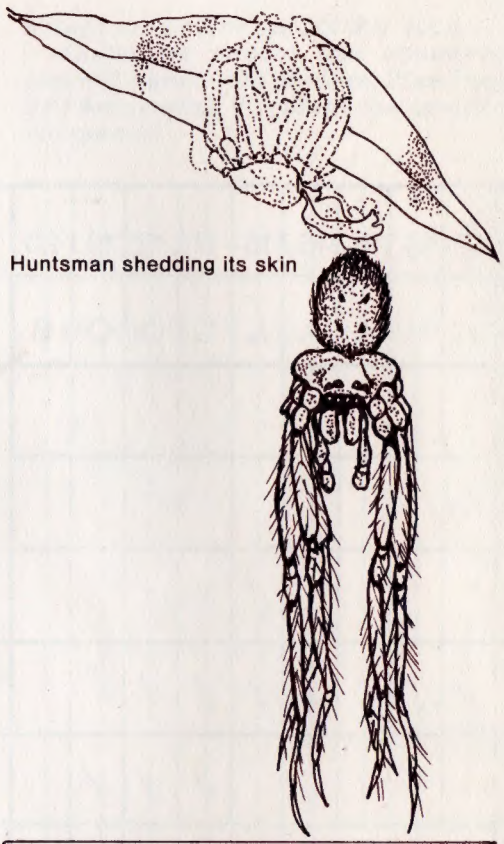
Bolas Spider

Moulting and Growth

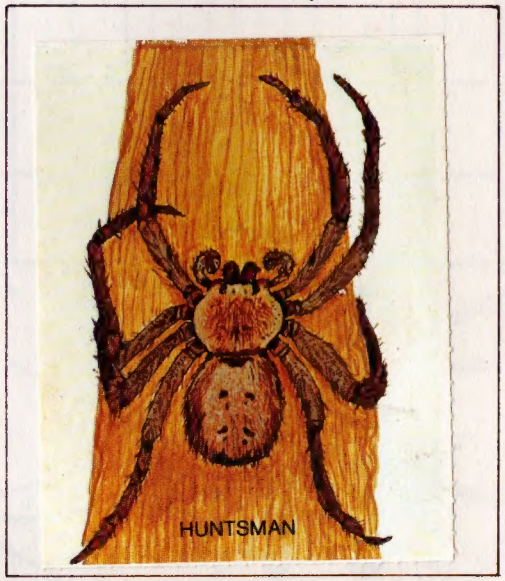
Like crabs, spiders have a tough skeleton outside their body and like crabs, this exoskeleton does not grow with the body it covers. Therefore, to reach maturity, most spiders will moult 5 or 6 times in their lives. In fact, the first moulting happens before the spiderlings hatch from the egg sac.

As the time for each moulting approaches, the spider cuts down on its food for several days. Just before moulting, it will suspend itself on a thread where it will hang throughout the process.

Beneath the old exoskeleton a new one has been growing. To discard the old skin, the spider creates aspecial fluid which loosens it and makes it split around the edges. After a lot of wriggling, the spider is free of the old skin and hangs just below it. Right now it is soft and vulnerable and must remain here, expanding as the new skin hardens. At this stage, the growing spider is almost defenceless. Its body is in danger of drying out and its new skin is often paler at first, making it easier for birds and other spider enemies to find it. For true spiders, about one full day is needed before their skins become normal again. For the more primitive mygalomorph spiders, like the Funnel Web spiders, the same process takes three or four days



Huntsman shedding its skin

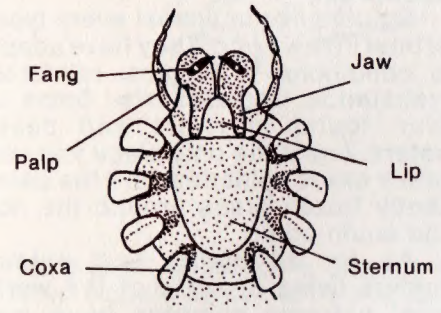


HUNTSMAN
Isopoda species

Just about everyone recognises the Huntsman. These large, hairy spiders are sometimes wrongly called 'tarantulas' or 'triantelopes' and often appear inside houses, scuttling sideways over walls and ceilings. Their more natural home, however, lies beneath the barks of trees. Flattened bodies and crab-like movements make them well suited to this habitat. For food, they depend on larger insects, including flies, moths and beetles. Although they are not said to be dangerous, a bite from a large Huntsman could be quite painful.

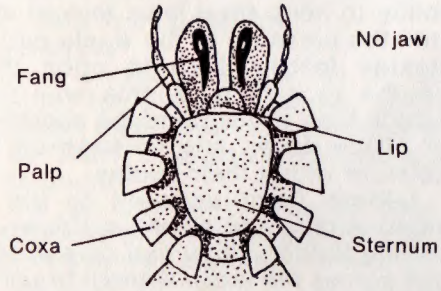
BL: ♂30mm ♀47mm ♂x 1½.

Feeding and Mouthparts



True Spider

Mygalomorph Spider



Although we normally think of spiders using webs to trap their food, most of them depend on speed, jumping ability or camouflage for catching their prey. However, spiders generally go about the business of eating in the same way.

Whatever method is used to capture the insect or similar mini-beast, the spider will usually seize it with the chelicerae (see Page 2) and will either kill or paralyse it with its poison fangs. Those spiders which use silk for webs will probably also use it to wrap up their prey before eating.

Spiders do not eat by chewing and swallowing but use a digestive juice to soften the food before sucking the body juices out of the victim into their own stomach. If you look around a spider's home, you might find the dried up remains of its prey.

Actually, the spider uses two 'stomachs'. The first one is the sucking stomach in the prosoma (see Page 2) and acts to draw in the food. From here it passes to the true stomach which is made up of a long pouch with branches reaching out to all parts of the body. Digested food is stored as sugar and provides energy for daily activity and growth. This energy is created when the sugar in the blood is combined with oxygen. As in humans, this process produces waste carbon dioxide. This is carried by the blood back to the lungs where it is exhaled.

FLOWER SPIDER
Diaea evanida

The Flower Spider builds no web but relies on its beautiful coloring to attract insects and smaller spiders within striking distance. It is fairly common to eastern Australia and easily recognised by the red and yellow markings on its abdomen. It belongs to the group known as Crab Spiders, their front two pairs of legs being much larger and thicker than the back pairs.

BL: ♂5mm ♀7mm ♀x 4.

Spiders in the Nature Web

We often use the word 'web', to describe things other than a spider's work. It can also be the name of a system of things which are all related, things which depend on each other for existence. In this way, the systems of living things in the world can be called a web: the web of life, or nature's web. Everything fits into it somewhere.

For spiders, there are many ways they affect this special 'web'. To begin with, they are possibly the world's largest consumers of insects. Only the birds might be as important as predators of insects. A single Wolf Spider, for instance, can eat seven large cockroaches and several smaller insects in one night. As insect controllers, they are often seen as the 'farmer's friend'.

Large Huntsman Spiders are sometimes recognised as good to have around the house for the same reason. Some naturalists have even used the Huntsman to protect them from the insects invading their tents as they sleep.

Enemies

Most animals are both prey and predator. For spiders, there is a large list of enemies. Even without us to swat or spray them with pesticides, there are enough natural predators to control the world's spiders. They include small rodents, snakes, fish, frogs, lizards, birds and, of course, other spiders. As well as those creatures which prey on spiders, there are many parasites which infest them and live off their bodies until they die. Ground-dwelling spiders without webs are most likely to be affected in this way. Sometimes it is worms (eg. Mermithid) which invade the spider's back so that the newly-hatched insect larvae (grubs) will have something to feed on.

Apart from losing their lives to parasites or hunters, spiders frequently lose part or all of their webs to birds. Because silk is strong, waterproof and insulating, many small birds such as Thornbills, Wrens and Warblers will use it in building nests.

Adaptation

Spiders live in almost every type of habitat in the world. They have adapted to conditions in jungles, rainforests, grasslands and deserts. Some are even found in rivers and coastal waters. About the only place you could safely say is spiderless are the permanently frozen areas around the north and south poles.

As for all plants and animals, spiders living in some of the world's most extreme climates have made special adaptations. In the desert, for instance, spiders have developed ways of saving the moisture in their bodies. A wax-like coat protects them from the heat and acts as a body 'seal'. As extra protection these spiders have the ability to keep their jaws locked shut until the pressure of the waste carbon dioxide forces them to open their mouths to exhale. In this way they reduce their exposure to the scorching air of the desert and so keep up the moisture within their bodies.

Others have adapted to life in watercourses and swamps. Known as Fishing Spiders, they can spread their legs across the water without breaking the surface. Often the two rear legs are used to hold on to a rock or plant. As the prey — small fish, tadpoles or frogs — pass below, it dives and drags the victim ashore to eat. One type of Fishing Spider is able to cross water in a series of jumps and not break the surface. Some can remain underwater for a long time, breathing the pockets of air trapped by the hairs of their body and legs.

Scamper

This game gives you a chance to see what it could be like to be a spider. As you play, you must keep clear of predators, eat something to keep up your strength, and 'Scamper' across the 'ground' to reach the web on the other side of the board.

It's not as easy as it seems.

To play:

The board is on page 25.

Two players.

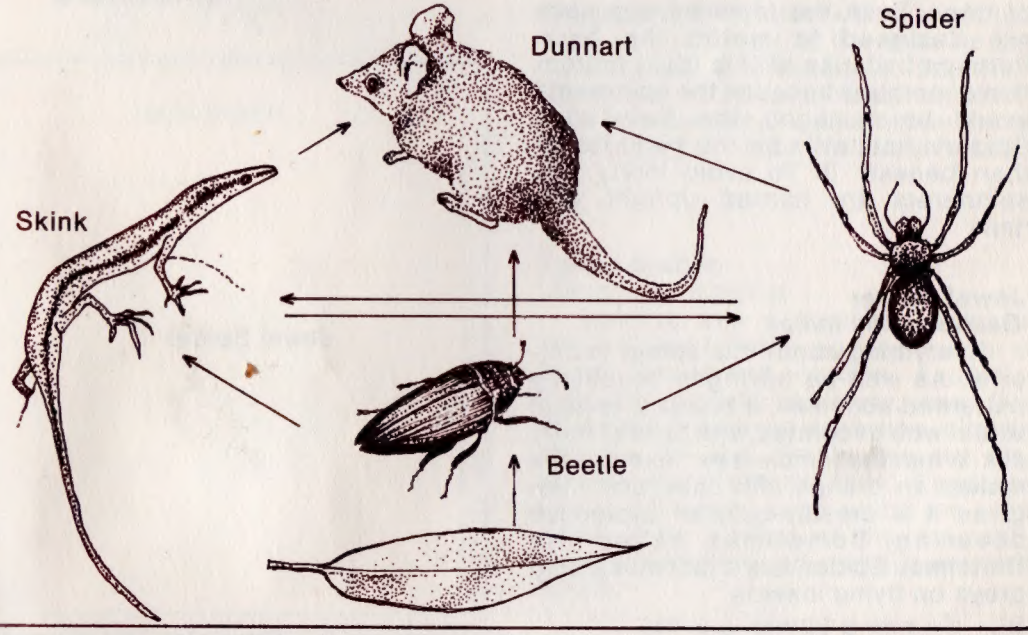
Each player makes a set of four markers, for Dunnart, Spider, Beetle and Skink (see below) and places them on the 'Start' squares on her own side of the board.

The aim is to get your spider safely into the web on the other side. Taking it in turns, you may move any animal (one at a time) in any direction, one square at a time. As they are moved, each animal can eat or be eaten by the others as shown in the drawing below. So, you can block your opponent's spider or protect your own with the other animal markers. An animal is 'eaten' when a predator reaches its square.

Some squares show changes in ground cover which can help you or slow you down. You might like to add more, using the empty squares.

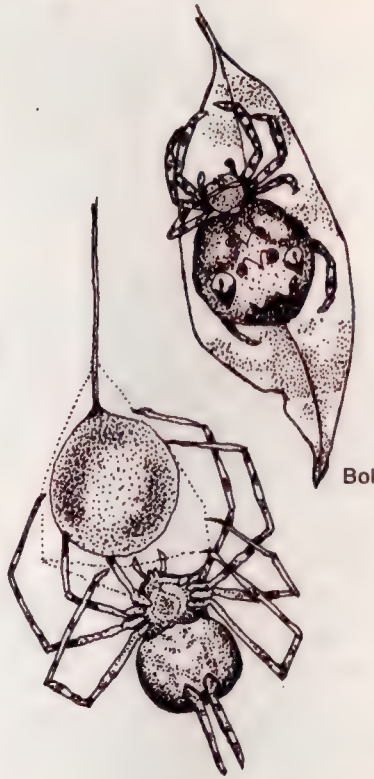
An animal is 'safe' when it is in a 'hide' square, or if it reaches the opposite square of its own sort.

The game ends when one spider reaches the opposite web corner or when both are eaten.



Bolas Spider

There are Bolas Spiders in quite a few families of Australian Spiders. Their name comes from the way they hunt and trap their prey. A bolas is a weapon used by some South American natives to trap animals. It is made up of two or three short ropes joined at one end, with a heavy ball at each other end. This is thrown at the legs of animals where it quickly wraps itself around and prevents the animal from escaping. The Bolas Spiders have the same technique. They use a silken thread with two or three sticky globules attached. As a moth approaches they swing the thread in a circle and release it when the insect is within range.



Bolas Spider

Two-Tailed

Hersiliidae Family

Spiders, of course, really have no tails. This one, however, has spinnerets almost as long as the abdomen. Although this makes them easy to recognise, they are still extremely difficult to see because of their camouflage. Their coloring and shape blend almost perfectly with the barks of trees. Even the female's egg sacs are designed to match the bark. Perhaps because of this ideal protection or perhaps because the spinnerets would be damaged, the Two-Tailed Spider's habitat is on the bark, rather than beneath it. To avoid injury, the spinnerets are carried upright, like 'tails'.

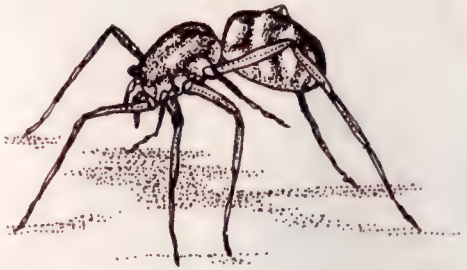
Two-Tailed Spider

Jewel Spider

Gasteracatha minax

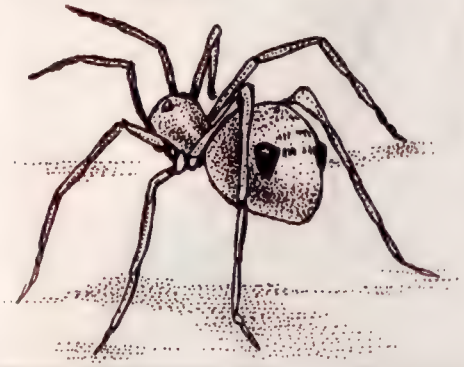
Everything about this spider is colorful. As well as having a beautifully patterned abdomen, it builds a vertical wheel web decorated with tufts of fluffy silk. When the female lays her eggs she makes an orange silk case and then gives it a creamy-colored protective covering. Sometimes called the Christmas Spider, it is a fast mover and preys on flying insects.

BL: ♂6mm ♀12mm ♀ x 1½.



Spitting Spider

Ant-mimicking Spider



Spitting Spider

Scytodidae Family

Although very common in most parts of Australia, Spitting Spiders catch their food in a way that is unique among spiders. Instead of building webs they creep close to the prey and squirt out a stream of sticky, poisonous juice from their fangs. The victim is almost instantly glued where it stands.

If you could study the dead insect closely with a lens, you would see that it is held by a zig-zag pattern of sticky threads. The spiders seem to be able to move their fangs rapidly from side to side to do this. However, the action is so fast that you could not expect to see it.

Ant-Mimicking

Amyciaea Family

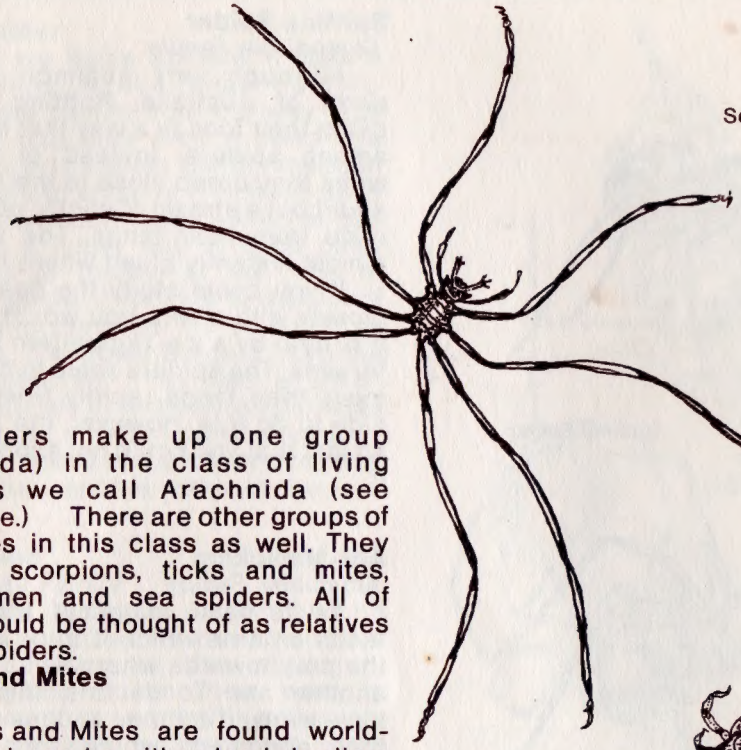
As its name suggests, this spider feeds on ants which it traps by luring the prey towards what seems like just another ant. To do this, the spiders have evolved a shape and markings on their abdomens which, from behind, actually make them look like ants. Sometimes they hang from a silk thread which is attached to a branch used as a pathway by the ants. As the insect goes to investigate the other 'ant' down the line, the spider seizes it. Others mimic the unusual behaviour of certain ants . . . with the same results.

Tailed Spider

Arachnura higginsi

Looking like a scorpion, with its long pointed tail, this unusual spider is found throughout eastern Australia. Only the female, however, has this strangely drawn out abdomen with its star-shaped end. The males are tiny spiders and have no 'tails'. Eggs are laid in dull green sacs which are kept in an open section of the orb web, usually camouflaged with leaves and debris.

BL: ♂2mm ♀20mm ♀ x 3.



Sea Spider

Spiders make up one group (Araneida) in the class of living animals we call Arachnida (see page one.) There are other groups of creatures in this class as well. They include scorpions, ticks and mites, harvestmen and sea spiders. All of these could be thought of as relatives of the spiders.

Ticks and Mites

Acarina

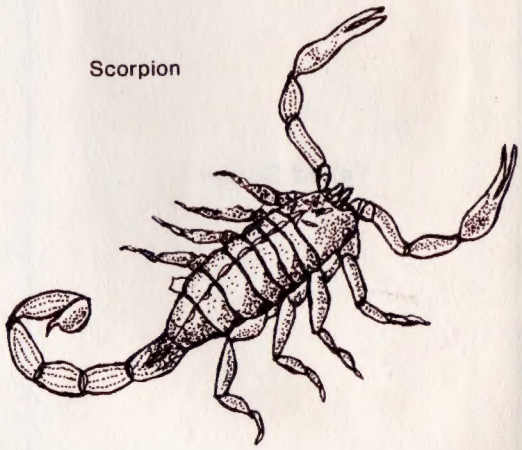
Ticks and Mites are found worldwide and can be either land-dwellers or aquatic. All are parasites which live by feeding off the bodies of other living plants and animals. Sometimes they transmit diseases to their host and may even cause its death. Their bodies are round or pear-shaped and, like spiders, are in two parts. This can be difficult to see because the "head" is usually very small. They lay eggs in soil and the young hatch with only 3 pairs of legs. They will go through several stages of a life cycle, often moving to a new host plant or animal each time.

Engorged Tick

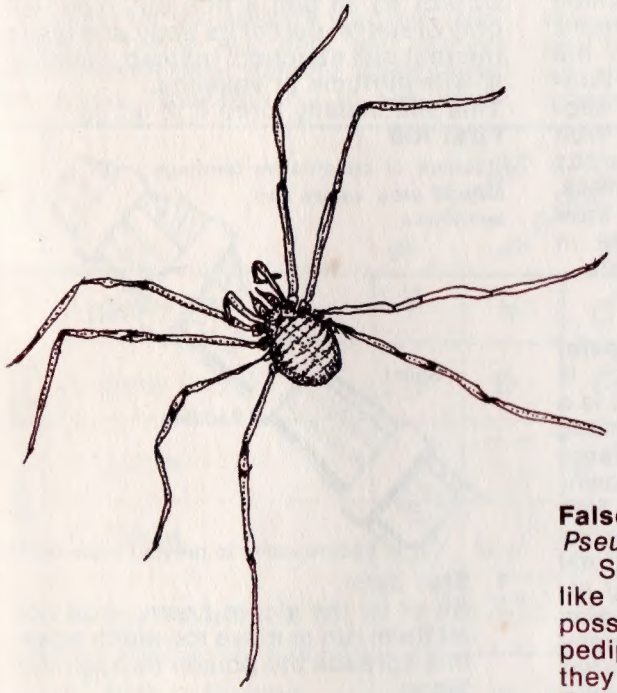
Scorpions

Scorpionida

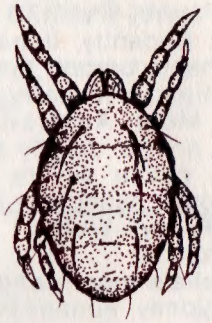
Scorpion fossils dating back to 400 million years make them one of the most ancient of ground arthropods. Being nocturnal, they usually spend the day beneath ground litter and are found in dry areas as well as in rainforests. At the end of their three-segment bodies is a sting which is often painful and can sometimes be dangerous to humans.



Scorpion



Harvestman



Mite

False Scorpion

False Scorpions

Pseudoscorpionida

Seldom seen, these tiny, scorpion-like arthropods have no tail sting but possess venom glands in their large pedipalps. With a special mouth gland they can produce silk for nest-making. False Scorpions are usually very flat, enabling them to slip into small cracks and are often found around or in books.

Harvestmen

Phalangida

Often mistaken for Daddy Long-leg spiders, Harvestmen have the same small round bodies and long, thin legs. They are omnivorous and feed on captured prey as well as remains of dead animals and plants. With no poison glands to help in hunting, Harvestmen feed mostly on small, dead organisms and tear the food into small pieces before squeezing out the juices. After mating, the eggs are laid in crevices of decaying matter.

Sea Spiders

Pycnogonida

These are not really spiders at all but are strange-looking creatures with eight lanky legs attached to a tiny body. They are marine-dwellers and stay mostly on the sea bed of coastal waters. Although usually very small, the leg-span of those of the deep sea could reach 50cm.

Dangerous Species and First Aid

Those spiders in Auistralia which are known to be dangerous to humans, even lethal, are the Red-Back, the Sydney Funnel-Web and the Tree Funnel-Web. Recently, it has been suggested that a certain species of Wolf Spider might also carry a dangerous venom. Most Australian spiders, however, are not deadly although their bite can cause severe reactions in some people, especially in children.

Sydney Funnel-Web

Atrax robustus

Australia's most dangerous spider is the Sydney Funnel-Web which is found over a wide area of N.S.W. It is a mygalomorph, a separate group among spiders with four book-lungs and large poisonous fangs which point downwards. This means the Funnel-Web has to rear up on its back legs to strike. It lives in a burrow with a silken funnel opening usually found among leaf litter, rocks and roots. Unlike the females which will live in their burrow for many years the smaller males die soon after mating. Both are nocturnal animals, pouncing on any beetles, cockroaches or crickets that pass near the opening of the burrow. Their main enemies are larger spider-hunting wasps which will actually enter the burrow, use a sting to paralyse the spider and then lay an egg on the helpless body. As the egg hatches, the wasp larvae (grub) feeds on the living spider.

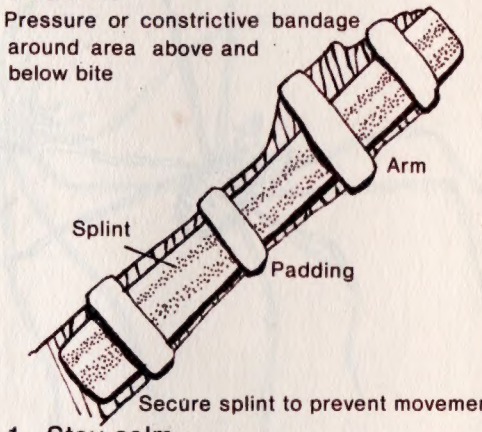
A sting from the Funnel-Web is lethal. An anti-venom for this has recently been developed. Nevertheless, extreme care should be taken with any Funnel-Web species. If bitten, quickly assist the victim's breathing and seek medical help immediately.

BL: ♂ 25mm ♀ 40mm ♀ x ¾.

Common Bush Tick

This parasite attaches itself to bodies passing through thick bush. Although usually found on wild mammals, it can infest humans and has been known to cause sickness, paralysis and even death. After walking in the bush, check your body carefully. Do not try to pull a tick out. You will only break off part of its body and leave the rest still attached. Instead, smother it with perfume or vaseline. This will usually force it to let go.

First Aid



1. Stay calm.
2. Sit or lie the victim down — do not let them run or move too much since this spreads the poison through the blood.
3. Use stretchy or elastic material to make a bandage as shown in the diagram.
4. Seek medical attention.

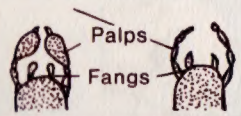
Checklist for Identifying Spiders

You could use this chart as a checklist for the spiders you find. The symbols below will help you record your observations quickly. Read Page 24 Spider Research Kit to see what tools are best to have with you. Remember, only collect for your survey and set the spiders free again as soon as you have finished recording the information.

	Name	eg. Huntsman	eg. Garden Orb	eg. Funnel-Web				
Spider's Body	1. Sex/Palps	♀	♀	♂				
	2. Body Size	D	B	B				
	3. Lungs	▫ ▫	▫ ▫	▫ ▫ ▫ ▫				
	4. Fangs	↳ ↲	↳ ↲	↓ ↓				
	5. Eye Pattern (P. 5)	∴	∵	∷				
Field Observations	6. Web or Burrow	B	W	B				
	7. Egg Sac	bright colors	×	×				
	8. Food							
	9. Where Found	under bark	In shrub	ground burrow				
	Book used for 10. Identification	Main P. 135	Main P. 189	Clyne P. 79				

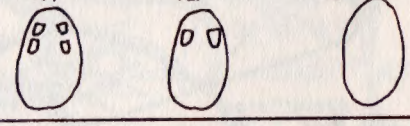
Symbols to Use

1. Sex/Palps
Male ♂ Female ♀



2. Body Size
A. 5mm
B. 5-15mm
C. 15-25mm
D. 25mm +

3. Lungs (Under Abdomen)
Mygalomorph, True Spiders



4. Fangs

5. Web or Burrow

Burrow — in ground, under rocks, etc.
— might have web at entrance.

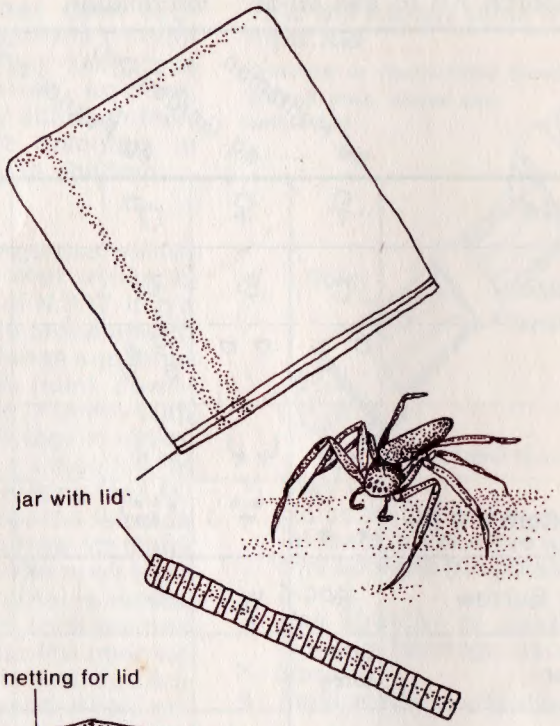
Keeping and Observing Spiders

Use a glass with lid for collecting. Never handle live spiders. As soon as you have finished your observations, return the spider to where it was collected and set it free.

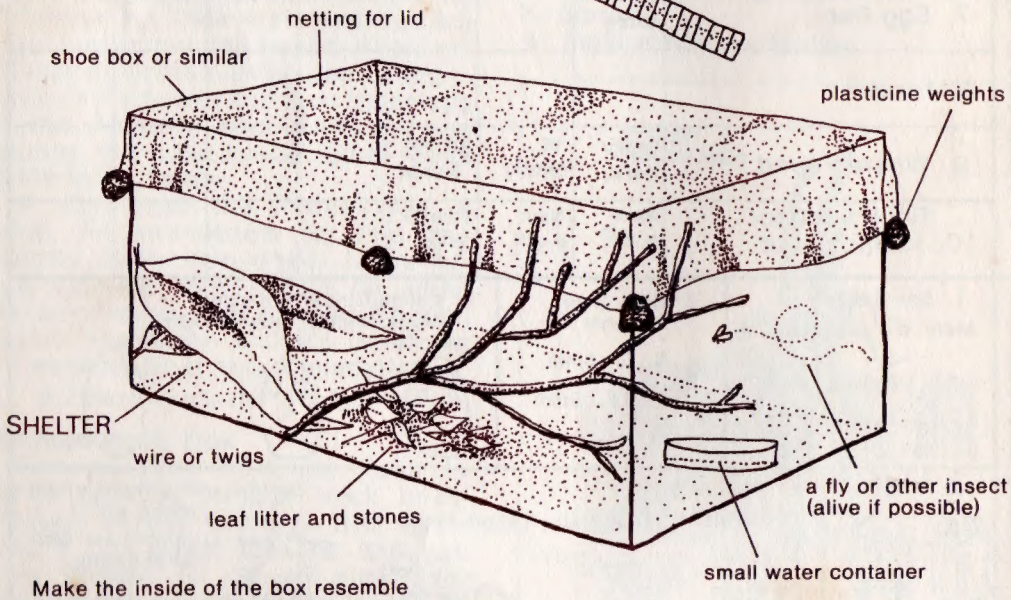
Spider Research Kit

magnifying lens
small pencil
notebook or checklist
(see Page 23)

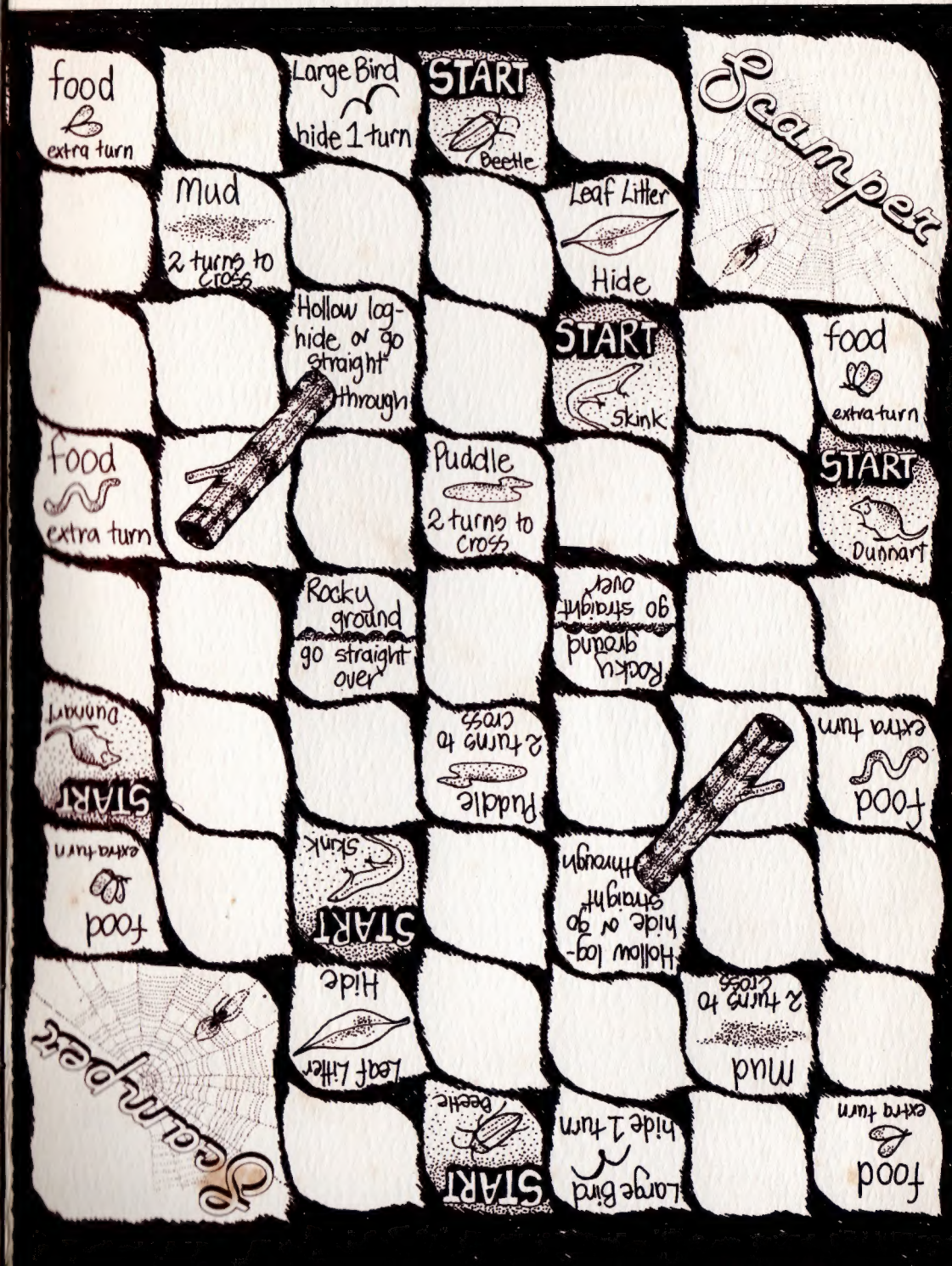
Catching Spiders



Observing Spiders



Make the inside of the box resemble the spider's natural habitat.



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